

**Descriptions — Labor and Industrial Relations
of
Courses**

958. Seminar in Collective Bargaining
Spring. 4(3-0) EC 858 or approval
of school.
Critical study of selected contemporary areas
and issues in collective bargaining.

**LABORATORY ANIMAL
RESOURCES LAR**

College of Veterinary Medicine

**501. Introduction to Veterinary
Medicine I**
Summer. 2(2-0) Admission to pro-
fessional veterinary program. Interdepartmental
with and administered by the Small Animal
Surgery and Medicine Department.
Species and breed identification, predisposition
for specific diseases, basic care and feeding,
restraint and handling of small domestic ani-
mals, unusual pet, and laboratory animals.

824. Laboratory Animal Medicine
Fall, Spring. 3(2-3) Completion of
ninth-term professional Veterinary Medicine
program.
Basic physiologic data, housing requirements,
genetics, breeding systems, diseases, humane
practices, and nutrition of major laboratory
animal species; administration of animal quar-
ters, techniques of handling and treatment.

**825. Comparative Medical
Experimentation**
Winter. 2(1-3) Graduate status, B.S.
in biological sciences and approval of depart-
ment.
Critical analysis of animal experimentation re-
ported in biological journals related to the
students' interest with special emphasis on
effects of environment and host variables upon
validity of experimental results.

826. Laboratory Animal Pathology
Spring. 4(3-3) Graduate status and
approval of department. Interdepartmental with
the Department of Pathology.
Macro and microscopic studies on the diseases
of laboratory animals, with special emphasis on
naturally-occurring diseases which might inter-
fere with the interpretation of experimental
results.

LANDSCAPE ARCHITECTURE

See Urban Planning and Landscape Architecture

**LARGE ANIMAL SURGERY
AND MEDICINE LSM**

College of Veterinary Medicine

**412. Livestock Hygiene and Disease
Control**
Winter. 3(3-0) Juniors; Agriculture
majors.
Fundamentals of health and disease in animals,
relation of infectious and parasitic diseases of
animals to human health, disease prevention
and role of veterinarian in preventive medicine.

**IDC. The Impact of Animal Resource
Management Upon the World's
Developing Nations**
Winter. 3(4-0)
For course description, see Interdis-
ciplinary Courses.

**502. Introduction to Veterinary
Medicine II**
Spring. 4(3-3) Admission to the pro-
fessional veterinary program. Interdepartmental
with and administered by the Small Animal
Surgery and Medicine Department.
Anesthetic principles, agents, and techniques.
Basic surgical principles, including aseptic
technic, hemostasis, wound healing, suturing
and suturing materials. Fundamentals of radi-
ology.

**503. Introduction to Veterinary
Medicine III**
Spring. 4(3-3) Admission to profes-
sional veterinary program. Interdepartmental
with the Department of Small Animal Surgery
and Medicine.
Physical and systemic examination of the vari-
ous domestic and laboratory species. Common
restraint procedures, clinical skills, diagnostics
and an approach to clients are included.

505. Large Animal Clinic I
Fall, Winter, Spring, Summer. 3(0-10)
Eighth-term or ninth-term Veterinary Medicine
students.
Clinical instruction and experience in diagnosis,
patient care, medication, surgery, disease pre-
vention, and herd health.

**521. Large Animal Surgery and
Medicine I**
Fall, Spring. 8(7-3) Seventh-term
Veterinary Medicine students.
Occurrence, etiology, symptomatology, diagnosis,
prognosis, treatment and prevention of diseases
of reproductive, digestive, and respiratory sys-
tems. Demonstrations of laboratory experience
in basic clinical skills including restraint, diag-
nosis, medication, and surgery.

**522. Large Animal Surgery and
Medicine II**
Winter, Summer. 6(5-3) 521.
Occurrence, diagnosis and treatment of surgical
diseases of large animals. Discussion of dis-
eases of cardiovascular, hematopoietic, urinary,
nervous and integumentary systems. Demonstra-
tions and laboratory experience in large animal
surgery techniques.

**523. Large Animal Surgery and
Medicine III**
Fall, Spring. 7(7-0) 522.
Occurrence, diagnosis and treatment of surgical
and reproductive diseases. Includes radiology
and diseases of locomotion.

531. Meat Hygiene
Fall, Spring. 2(2-0) Ninth-term
Veterinary Medicine students.
Judging fitness of meat for human consumption
based on a knowledge of bacteriology, para-
sitology and pathology. Organization and oper-
ation of meat inspection programs. Field trip
required.

605. Large Animal Clinic II
Fall, Winter, Spring, Summer.
12(0-36) 505.
Advanced clinical instruction and experience in
diagnosis, patient care, medication, surgery, dis-
ease prevention, and herd health. Includes
handling of clinic patients under direct super-
vision of staff veterinarians and ambulatory
clinic.

**624. Large Animal Surgery and
Medicine IV**
Winter, Summer. 4(4-0) 523.
Etiology, pathogenesis, epidemiology, pathologi-
cal changes, differential diagnosis, prevention,
control and treatment of specific infectious dis-
eases of large animals.

**630. Veterinary Economics and
Practice Management**
Fall, Spring. 3(3-0) Veterinary medi-
cine students.
Management and business principles of veteri-
nary medical practice.

**809. Problems in Large Animal
Surgery**
Fall, Winter, Spring, Summer. Vari-
able credit.

**811. Problems in Large Animal
Medicine**
Fall, Winter, Spring, Summer. Vari-
able credit.

813. Seminar
Fall, Winter, Spring. 1 credit.

823. Special Surgery
Spring. 3(1-6) May re-enroll for a
maximum of 6 credits. Approval of department.
Surgical techniques and tissue reactions follow-
ing surgery in large animals.

899. Research
Fall, Winter, Spring, Summer. Vari-
able credit. May re-enroll for a maximum of
18 credits. Approval of department.
Research on thesis problems.

LATIN

See Romance Languages

**LINGUISTICS AND ORIENTAL
AND AFRICAN LANGUAGES**

College of Arts and Letters

Courses in CHINESE and JAPANESE on the 300
level or higher are normally conducted in the
language.

**Linguistics and Oriental and African
Language Courses LOA**

299. Special Projects
Fall, Winter, Spring, Summer. Variable
credit. May re-enroll for a maximum of 18
credits. Approval of department.
Work in areas outside regular course offerings.

315. World Literature in English
Fall. 3(3-0) *Interdepartmental with and administered by the English Department.* Representative works, not from England or the United States, which were written originally in English, especially the English literature of present or former British Commonwealth nations, and nations from the Middle East and Africa.

316. World Literature in English Translation
Winter. 3(3-0) *Interdepartmental with the English Department.* Significant and characteristic works of the Orient, the Middle East, and Africa in English translation.

317. Genres and Themes in World Literature
Spring. 3(3-0) *Interdepartmental with and administered by the English Department.* Work will center each term around a single literary genre, type or theme. Typical examples: The Quest, Literature of Revolt, Satire, Literary examples will be selected from several national literatures.

499. Special Projects
Fall, Winter, Spring, Summer. *Variable credit. May re-enroll for a maximum of 18 credits. Approval of department.* Work in areas outside regular course offerings.

African Languages

AFR

101. African Languages-Elementary
Fall. 5(3-2) *May re-enroll for 101-102-103 sequence in more than one African language.* Comprehension and speaking taught by a linguist with native informants. Offerings include Bemba, Hausa, Ibo, Pidgin, Swahili, Yoruba. These and other African languages are taught upon sufficient demand and availability of instructors.

102. African Languages-Elementary
Winter. 5(3-2) *May re-enroll for 101-102-103 sequence in more than one African language. 101.* Continuation of 101.

103. African Languages-Elementary
Spring. 5(3-2) *May re-enroll for 101-102-103 sequence in more than one African language. 102.* Continuation of 102.

200H. Honors Work
Fall, Winter, Spring. 1 to 16 credits. *Approval of department.*

201. African Languages-Intermediate
Fall. 4(5-0) *May re-enroll for 201-202-203 sequence in more than one African language. 103 in appropriate language or approval of department.* Continuation of African Languages-Elementary. Comprehension, speaking, reading and writing taught by a linguist with native informants. See AFR 101 for languages available.

202. African Languages-Intermediate
Winter. 4(5-0) *May re-enroll for 201-202-203 sequence in more than one African language. 201.* Continuation of 201.

203. African Languages-Intermediate
Spring. 4(5-0) *May re-enroll for 201-202-203 sequence in more than one African language. 202.* Continuation of 202.

400H. Honors Work
Fall, Winter, Spring. *Variable credit. Approval of department.*

420. African Literature in Translation
Fall, Winter, Spring. 3(3-0) *May re-enroll for a maximum of 9 credits. Juniors or approval of department.* Development and influence of the ideas, forms and motifs of African literatures in the literatures of the world.

450. African Languages-Advanced
Fall, Winter, Spring. *Variable credit. May re-enroll for maximum of 18 credits. Approval of department.* Advanced training or specialized research in particular African languages.

Chinese

CHS

101. Elementary Chinese
Fall. 5(3-5) Introduction to Mandarin, the official spoken language of China, with emphasis on pronunciation drill and conversation practice.

102. Elementary Chinese
Winter. 5(3-5) 101. Continued practice in conversation and aural comprehension; introduction to the reading and writing of Chinese characters.

103. Elementary Chinese
Spring. 5(3-5) 102. Continuation of 102 and grammatical analysis of basic Chinese sentence structure.

200H. Honors Work
Fall, Winter, Spring. 1 to 16 credits. *Approval of department.*

201. Second-Year Chinese
Fall. 3(3-0) 103. Conversation, reading, and writing at the intermediate level.

202. Second-Year Chinese
Winter. 3(3-0) 201. Reading of advanced texts; introducing Chinese radicals and practice in the use of a Chinese dictionary.

203. Second-Year Chinese
Spring. 3(3-0) 202. Continuation of 202; selected texts from Chinese newspapers, periodicals, and political journals.

221. Second-Year Conversation and Composition
Fall. 2(2-0) 103. Conversation and composition at the intermediate level to supplement 201.

222. Second-Year Conversation and Composition
Winter. 2(2-0) 221. Continuation of 221.

223. Second-Year Conversation and Composition
Spring. 2(2-0) 222. Continuation of 222.

250. Chinese Calligraphy
Spring. 2(2-0) *One year in Chinese language or approval of department.* The essential characteristics of and fundamental skills involved in writing Chinese characters, from the point of view of practical use.

301. Readings in Modern Chinese Literature
Fall. 3(3-0) 203. Selected short stories from authors of the twentieth century.

302. Readings in Modern Chinese Literature
Winter. 3(3-0) 301. Selected essays from authors of the twentieth century.

303. Readings in Classical Chinese Literature
Spring. 3(3-0) 302. Selections from the writings of the important philosophers, historians, and poets.

321. Conversation and Composition
Fall, Winter, Spring. 3(3-0) *May re-enroll for a maximum of 9 credits. 203.* Directed topical conversation and practice in composition.

400H. Honors Work
Fall, Winter, Spring. *Variable credit. Approval of department.*

401. Survey of Chinese Literature
Fall, Winter, Spring. 3(3-0) *May re-enroll for a maximum of 9 credits. Oral command and reading knowledge of Chinese language.* Survey of Chinese literature from earliest record to contemporary writings. Lectures and discussions conducted in Chinese. Most assigned readings in Chinese, some in English translation.

420. Oriental Literature in Translation
Fall, Winter, Spring. 3(3-0) *May re-enroll for a maximum of 9 credits. Juniors or approval of department.* Development and influence of the ideas, forms and motifs of Far Eastern literatures in the literatures of the world.

431. Chinese Poetry
Fall. 3(3-0) *Reading knowledge of Chinese.* Rise and development of Chinese poetry with particular attention to poetry of the T'ang Dynasty.

432. Chinese Drama
Winter. 3(3-0) *Reading knowledge of Chinese.* Special emphasis on drama of the Yuan Dynasty.

433. Chinese Novels
Spring. 3(3-0) *Reading knowledge of Chinese.* The most important vernacular novels.

**Descriptions — Linguistics and Oriental and African Languages
of
Courses**

Japanese

JAP

- 101. Elementary Japanese**
Fall. 5(4-1)
Spoken and written Japanese; emphasis on conversation and easy reading.
- 102. Elementary Japanese**
Winter. 5(4-1) 101.
Continuation of 101.
- 103. Elementary Japanese**
Spring. 5(4-1) 102.
Continuation of 102.
- 201. Second-Year Japanese**
Fall. 3(3-0) 103.
A second-year course, stressing both oral and written Japanese.
- 202. Second-Year Japanese**
Winter. 3(3-0) 201.
Continuation of 201.
- 203. Second-Year Japanese**
Spring. 3(3-0) 202.
Continuation of 202.
- 221. Second-Year Composition**
Fall. 2(2-0) 103.
Review grammar and composition to supplement 201.
- 222. Second-Year Composition**
Winter. 2(2-0) 221.
Continuation of 221.
- 223. Second-Year Composition**
Spring. 2(2-0) 222.
Continuation of 222.
- 400H. Honors Work**
Fall, Winter, Spring. Variable credit.
Approval of department.

Linguistics

LIN

- 200. Language and Linguistics**
Fall, Winter, Spring. 3(3-0)
Especially for students in areas other than linguistics, this course consists of an introduction to language and linguistics, emphasizing the application of linguistics to various other disciplines.
- 401. Introduction to Linguistics**
Fall, Winter, Spring. 3(3-0) Juniors or approval of department. Not open to students with credit in 200.
The scientific study of human languages. Basic goals, assumptions, terminology, and research results of modern theoretical and applied linguistics, with examples from a variety of languages.
- 402. Phonology**
Fall, Winter, Spring. 3(3-0) 401 or approval of department.
Sounds and sound systems, emphasizing the four basic areas of articulatory phonetics, phonetic features and components, classical phonemics, and phonology in contemporary linguistic theories.

- 403. Morphology**
Fall, Winter, Spring. 3(3-0) 402 or concurrently.
Structure of words, covering the identification and classification of morphemes, morphonemic alternation, and morphology in contemporary linguistic theories.
- 421. Articulatory Phonetics**
Fall, Winter, Spring. 3(2-2) Approval of department.
Development of phonetic skills for the learning and teaching of languages.
- 431. Introduction to Transformation Grammar**
Winter, Spring. 3(3-0) 401 or approval of department.
Investigation of the origin and development of transformational theory of syntax; properties of deep structure, surface structure, and transformations; application of transformational concepts to native and foreign language learning.
- 441. Introductory Readings in Linguistics**
Fall, Winter, Spring. 3(3-0) 401.
Critical reading of basic texts of modern linguistics.
- 471. Principles and Methods of Historical Linguistics**
Winter. 3(3-0) 403 or concurrently.
Types of linguistic change and the methods used by linguists to study the historical development of languages and language families.
- 811. History of Linguistics**
Fall. 3(3-0) Approval of department.
The origin and development of linguistic studies from ancient India and Greece to the present. Provides a foundation for the understanding of contemporary issues in linguistics.
- 821. Phonological Analysis**
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 9 credits. Approval of department.
Advanced study of phonology, generally utilizing one of the following theories: stratificational, tagmemic, transformational.

- 831. Grammatical Analysis**
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 9 credits. Approval of department.
Advanced study of syntax and related topics, generally utilizing one of the following theories: stratificational, tagmemic, transformational.
- 835. Semantics of Natural Languages**
Spring. 3(3-0) 431 or approval of department.
Selected topics on the study of meaning in human languages. History, issues, and theories of semantics.
- IDC. Interdisciplinary Seminar on Africa**
For course description, see Interdisciplinary Courses.

- 841. Field Methods**
Fall. 3(3-0) May re-enroll for a maximum of 9 credits. 403 or approval of department.
Methods of working with informants in order to gather linguistic information, processing and analyzing data, writing linguistic descriptions.

- 851. African Linguistics**
Winter. 3(3-0) May re-enroll for a maximum of 9 credits. 401; 402 or concurrently.
Investigation of linguistic issues and phenomena in one or a group of African languages.

- 860. Special Projects**
Fall, Winter, Spring, Summer. Variable credit. Approval of instructor.
Supervised study, reading, and research in specialized areas of linguistics.

- 865. Contrastive Analysis**
Spring. 3(3-0) 403.
The essentials of contrastive analysis, with emphasis on methods of making such analysis. The usefulness of and controversies concerning contrastive analysis will also be discussed.

- 871. Comparative Indo-European Linguistics**
Spring of odd-numbered years. 3(3-0) 471.
Comparative linguistics as applied to the investigation of the development and historical relationships of the languages of the Indo-European family.

- 880. Seminar in Linguistics**
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 18 credits in different topics. Approval of department.
Advanced critical study of current topics in linguistics such as applications to other disciplines, aspects of linguistic theory, child language acquisition, contrastive analysis, structure of particular languages.

- 899. Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of instructor.

- 980. Seminar in Linguistics**
Spring. 3(3-0) May re-enroll for a maximum of 9 credits in different areas. Approval of department.
Special topics in linguistics for advanced graduate students.

- 999. Research**
Fall, Winter, Spring. Variable credit. Approval of instructor.

South Asian Languages

SAL

- 101. South Asian Languages—Elementary**
Fall. 5(3-2) May re-enroll for 101-102-103 sequence in more than one South Asian Language.
The spoken language. Emphasis on intensive pronunciation, comprehension drills, and developing sentence structure. Orthography introduced.
- 102. South Asian Languages—Elementary**
Winter. 5(3-2) May re-enroll for 101-102-103 sequence in more than one South Asian Language. 101.
Continuation of 101.
- 103. South Asian Languages—Elementary**
Spring. 5(3-2) May re-enroll for 101-102-103 sequence in more than one South Asian Language. 102.
Continuation of 102.

201. South Asian Languages—Intermediate
Fall. 4(3-2) May re-enroll for 201-202-203 sequence in more than one South Asian Language. 103.
Continued development of oral and aural skills. Study of grammar, readings in simple texts and exercises in composition.

202. South Asian Languages—Intermediate
Winter. 4(3-2) May re-enroll for 201-202-203 sequence in more than one South Asian Language. 201.
Continuation of 201.

203. South Asian Languages—Intermediate
Spring. 4(3-2) May re-enroll for 201-202-203 sequence in more than one South Asian Language. 202.
Continuation of 202.

**LYMAN BRIGGS
COLLEGE**

LBC

111. College Algebra
Fall. 5(5-0) Placement Test or approval of the college. Not open to students with credit in MTH 108, 109, or 111.
Topics covered include polynomial, trigonometric, exponential, and logarithmic functions, their inverses and their properties; and analytic geometry with an emphasis on conics.

112. Calculus I
Fall, Winter, Spring. 5(5-0) 111 or MTH 109; LBC 124 concurrently. Not open to students with credit in MTH 112.
Topics covered include sequences and their limits, derivatives of rational power functions, techniques of differentiation, applications, numerical methods for evaluating polynomials and approximating square roots.

113. Calculus II
Fall, Winter, Spring. 5(5-0) 112 and 124. Not open to students with credit in MTH 113.
Continuation of 112. Topics covered are applications of the derivative integration, exponential, logarithmic, and trigonometric functions, power series, and numerical methods for integrating, root finding, and series evaluating.

124. APL-Computer Programming for Scientists
Fall, Winter, Spring. 3(3-0) 112 or concurrently. Interdepartmental with the Computer Science Department.
APL programming; interactive programming techniques; arithmetic, logical, and extended APL operators; functions; applications to concurrent topics in mathematics; principles of operations of time-shared computers.

131. Third Culture Rhetoric I
Fall, Winter. 4(4-0)
Instruction and practice in expository writing. Paper and report topics drawn from readings which relate science and human values.

132. Third Culture Rhetoric II
Winter, Spring. 4(4-0) 131.
Continuation of 131 with emphasis upon investigative papers. Selected students may meet course requirements through independent study.

140. Biology I
Winter, Spring. 3(2-3) Not open to students with credit in B S 212.
Development of the concept of terrestrial and aquatic ecosystems and the maintenance and manipulation of energy, materials, and space at the organismal level of organization.

***141. Biology II**
Fall, Spring. 3(2-3) 140; Not open to students with credit in B S 211.
Maintenance and manipulation of materials, energy, space and information at the cellular and tissue level of organization.

142. Biology IA
Winter, Spring. 1 to 2 credits. May re-enroll for a maximum of 4 credits. 140 or concurrently.
Selected problems such as analysis of biological data, interspecific and intraspecific competition, microarthropods inhabiting leaf litter, spring flora, diversity, stability and evolution of natural communities.

143. Biology IIA
Fall, Spring. 2 to 4 credits. May re-enroll for a maximum of 4 credits. 141 or concurrently.
Selected biology problems considering such topics as genetics, bacterial culturing and staining techniques, photosynthesis and histological techniques.

150. Physics—Elementary Concepts
Fall. 1(2-0) MTH 108 or 109 or LBC 111 and LBC 151 concurrently.
Elementary concepts of mechanics, electricity, magnetism and optics.

151. Introduction to Chemistry and Physics I
Fall. 4(4-3) MTH 108 or 109 or LBC 111 concurrently; high school physics or 150 concurrently.
Fundamental techniques of quantitative scientific investigation; gas laws, kinetic theory and thermodynamics.

152. Introduction to Chemistry and Physics II
Winter. 4(4-3) 151.
Topics in modern physics: photons, electrons, atoms and nuclei; radioactivity, nuclear reactions; Bohr theory of the hydrogen atom; special theory of relativity.

153. Introduction to Chemistry and Physics III
Spring. 4(4-3) 152.
Topics in modern chemistry: atomic structure, chemical bonding, molecular orbitals; stoichiometry, chemical dynamics and equilibria, fundamentals of organic chemistry.

216. Calculus III
(215.) Fall, Winter, Spring. 5(5-0) 113.
Introduction to the calculus of several variables.

217. Calculus IV
(214.) Fall, Winter, Spring. 5(5-0) 216.

Topics covered include infinite series, power series, and introduction to differential equations; first order, second order linear with constant coefficients, first order systems; numerical methods, power series solutions, and applications.

233. Special Topics in Third Culture Rhetoric
Fall, Winter, Spring. 1 to 2 credits. May re-enroll for a maximum of 6 credits. 132
Guided study of relations between the humanities and sciences. Students submit written work.

***242. Biology III**
Fall, Winter. 4(3-3) 141.
Organismal growth and development from molecular genetics through life cycles of selected plant and animal species.

251. Introduction to Chemistry and Physics IV
Fall. 4(4-3) 153.
Classical physics; kinematics and dynamics of particles and rigid bodies; electricity; magnetism, electromagnetism, wave motion and wave optics.

252. Introduction to Chemistry and Physics V
Winter. 4(4-3) 251.
Chemistry of non-metals, transitional elements and coordination compounds, organic chemistry.

253. Introduction to Chemistry and Physics VI
Spring. 4(4-3) 252.
Relativity; atomic, molecular, and solid-state physics, quantum-mechanical effects and devices, nuclear models and nuclear energy levels.

IDC. Energy Consumption and Environmental Quality
For course description, see Interdisciplinary Courses.

290. Directed Study
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 6 credits. Approval of college.
Faculty directed studies in curricular areas which are normally related to regular course offerings.

- A. Directed Study—General
1 or 2 credits.
- B. Directed Study—Biology
1 or 2 credits.
- C. Directed Study—Chemistry/Physics
1 or 2 credits.
- F. Directed Study—Computer Science
1 to 3 credits.

295. Independent Study
Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 12 credits. Approval of college.
Student conceived individual courses of study in curricular areas. Preliminary faculty approval and continuing guidance.

- A. Independent Study—General
- B. Independent Study—Biology
- C. Independent Study—Chemistry/Physics
- D. Independent Study—Mathematics
- E. Independent Study—Science Studies

331. Modern Fiction
Fall. 4(4-0) 132 or 131 with a 3.0 or better.
Recent fiction and its cultural backgrounds, particularly those of special value to students of science. Students may submit original fiction in partial fulfillment of course writing requirements.

*For prerequisite purposes, this introductory biology sequence may be used in place of Biological Science 210, 211, 212.